

Review Paper on the Diagnosis, Treatment and Prevention of the Jaundice

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Abstract: *Jaundice is a complex disease. Jaundice is actually the high bilirubin level in the body. Yellowing of skin, mucous membranes and skin are common presentations of jaundice. Jaundice has various variants including pre-hepatic jaundice (due to haemolysis of red blood cells), hepatic jaundice (due to defect in capture, conjugation and excretion of bilirubin by liver) and post hepatic jaundice (due to the obstruction of extra hepatobiliary system). The causes of various variants of Jaundice is either acquired or congenital. High plasma bilirubin level can cause various manifestations involving satiety, gastrointestinal bleeding, diarrhea, anemia, edema, weight-loss and can be fatal because it can cause psychosis, lethargy, seizures, coma or even death. High bilirubin level can help in the diagnosis of Jaundice. Differential diagnosis of various variants of Jaundice can be carried out on the basis of bilirubin level (conjugated and unconjugated), ultrasonography and other radiological techniques. The proper management of Jaundice is high water intake and low fat diet. The primary effective treatment for pre-hepatic jaundice and neonatal physiological jaundice is phototherapy. Infusion of immunoglobulins is also used for treatment of pre-hepatic jaundice. Proper nutrition, steroids and immunosuppressant are used for treatment of hepatic jaundice. The treatment for post hepatic jaundice is decompression and surgery..*

Keywords: bilirubin, pre-hepatic jaundice hepatic jaundice, , bleeding, diarrhea, anemia, edema, weight-loss psychosis, lethargy, seizures, coma, fat diet, immunoglobulin, nutrition, steroids, immunosuppressant

I. INTRODUCTION

Jaundice is characterized by a yellowing of the skin, mucous membranes, and sclera brought on by the accumulation of bilirubin, a yellow-orange bile pigment. An endogenously produced pigment called bilirubin has the potential to be harmful, especially to young children. The characteristic spectrographical peak of unconjugated bilirubin is located at 450 nm. Actually, the word "jaundice" comes from the French word "jaune," which meaning "yellow." Jaundice is a sign of hyperbilirubinemia, which can be either conjugated or unconjugated bilirubin at high levels. When the bilirubin level surpasses 34.2 $\mu\text{mol/L}$ or 2 mg/dL, the clinical manifestations of jaundice manifest.

Heme group serves as the substrate for the synthesis of bilirubin. Iron, carbon monoxide, and biliverdin are released when the heme is catabolized at the alpha carbon bridge by the enzyme heme oxygenase. Biliverdin reductase further breaks down biliverdin to create bilirubin. Heme group of hemoglobin is the source of 80% of bilirubin. The breakdown of red blood cells in the reticuloendothelium of the liver, spleen, and bone marrow produces this hemoglobin. The remaining 20% of bilirubin is derived from a variety of sources, including cytochromes and myoglobin. In normal adulthood, 3.8 mg/kg, or roughly 250–300 mg, of bilirubin are produced daily. Neonates produce a far greater quantity of bilirubin than do adults. After that, the bound form of the bilirubin is sent to the liver together with plasma albumin. $K_d=7 \times 10^7 \text{M}^{-1}$ is the dissociation constant for the first albumin binding site. UDP-glucuronyltransferase in the liver conjugates bilirubin, which is necessary for the molecule's water solubility and excretion.UDP-glucuronyltransferase activity is affected by age, gender, thyroid hormones, and drugs that induce microsomal enzymes, like rifampicin and Phenobarbital.

II. HISTORY OF JAUNDICE

- Jaundice comes from the French word *jaune* in circa 1300 AD, meaning yellow. And the word 'jaunis' itself is derived from an earlier French word 'jalnice'.
- In 1885, Lührman noted jaundice as an adverse effect of vaccination.

- In 1908, McDonald suggested that jaundice may be caused by an agent much smaller than a bacterium.
- In 1935, A. O. Whipple, an American surgeon first described obstructive jaundice.
- During WWII, approximately 16 million people died as a consequence of hepatitis. This led to a lot of research on vaccines and different type of hepatitis.
- In 1947, Clinicians divided hepatitis into two types including epidemic/infectious hepatitis and serum hepatitis (SH). Epidemic hepatitis had a short incubation period, serum hepatitis had long incubation period.
- In 1953, World Health Organization (WHO) suggested usage of the terms hepatitis A for infectious hepatitis and hepatitis B for serum hepatitis.
- During 1950-1970, an epidemic of viral hepatitis took place in China, India and the adjoining region. This led to the discovery of hepatitis E virus.
- In 1974, a third virus was discovered that causes infectious hepatitis, other than hepatitis A virus (HAV) and hepatitis B virus (HBV). It was named non-A, non-B hepatitis (NANBH).
- In 1977, hepatitis D virus was discovered.
- In 1995, the GB virus-C was discovered that targets liver.
- In 1997, transfusion-transmitted virus (TTV) was discovered in patient with non A-B-C-G hepatitis.

III. TYPES OF JAUNDICE

Jaundice Neonatal:

Jaundice in newborns is not uncommon. It happens when the liver is immature and not working properly. Neonatal jaundice is usually not a cause for concern. It normally goes away after a week and doesn't require treatment.

Jaundice in adults and children:

When jaundice develops in children or adults, it typically indicates a health issue. Three varieties of jaundice exist.

Hepatocellular Jaundice:

The most prevalent kind of jaundice is hepatocellular jaundice. It happens when bilirubin cannot be eliminated from the body by the kidneys or escape the liver cells. Hepatocellular jaundice is typically brought on by liver illness (cirrhosis), hepatitis (liver inflammation), liver failure, or certain drug side effects.

Haemolytic Jaundice:

When a high number of red blood cells are broken down, an excessive amount of bilirubin is created. This condition is known as hemolytic jaundice. Numerous illnesses, including anemia or issues with the metabolism (the body's process of generating and utilizing energy), may be the cause of this.

Obstructive Jaundice:

When there is a bile duct obstruction (blockage), bilirubin cannot exit the liver and causes obstructive jaundice. Typically, a gallstone, tumor, or cyst in the pancreas or bile duct causes this kind of jaundice.

Symptoms of Jaundice:

Following are the major jaundice symptoms:

1. Extreme weakness
2. Fever and headache
3. Appetite decline
4. Extreme diarrhea
5. Nausea
6. Yellow discoloration on the mouth, skin, and eyes and urine
7. Weakness in the area of the liver

Causes Of Jaundice

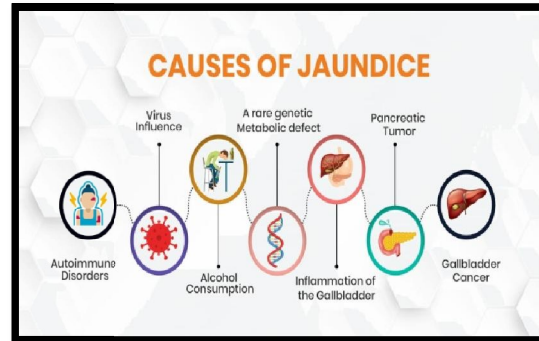


Fig:- Causes of the jaundice.

Treatment Of Jaundice:

In adults, jaundice normally doesn't need to be treated, but the course of treatment is mostly determined by the underlying cause of the condition. The best course of treatment for jaundice is to address the underlying hematological or hepatobiliary condition. The following are a few options for managing and treating jaundice

- your baby's gestational age, overall health, and medical history extent of the disease.
- your baby's tolerance for specific medications, procedures, or therapies.
- expectations for the course of the disease.
- your opinion or preference.
- Treatment depends on many factors, including the cause of the jaundice and the level of bilirubin. The goal is to keep the level of bilirubin from increasing to dangerous levels.
- If acute viral hepatitis is the source of jaundice, it will go away on its own when the liver starts to recover.
- Medication like cholestyramine or colestipol can help patients with moderate to severe pruritus.
- If all Other less successful treatments include:
- Rifampin
- Naltrexone
- Sertraline
- Phenobarbita
- Iron-based medications are used to treat haemolytic jaundice. It also works well to incorporate foods high in iron into the diet.
- Jaundice can also be effectively treated with steroids.
- other medical treatments for pruritus are unsuccessful, liver transplantation can be the only viable option. Depending on the severity of the liver impairment, a liver transplant may also be recommended if jaundice is the result of liver breakdown.

Medical Treatment:

The medical disease producing the jaundice, along with any accompanying symptoms or complications, determines the course of treatment.

The following treatments are possible:

- supportive care,
- IV fluids in cases of dehydration,
- medications for nausea/vomiting and pain,
- antibiotics,
- antiviral medications,
- blood transfusions,

- steroids,
- chemotherapy/radiation therapy, and
- phototherapy (newborns).



Fig. Medical Treatment of Jaundice

Medications:

Medications could or might not be required. The medical professional will oversee the patient's therapy and, if required, provide prescriptions for medicine after determining the reason of the patient's jaundice. As previously mentioned, different drug alternatives are available based on the underlying etiology of the jaundice.



Fig. Medication of Jaundice

Surgery of Jaundice:

Your skin and the whites of your eyes become yellow when you have jaundice. Bilirubin excess leads to jaundice. Hemoglobin, the material in your red blood cells that delivers oxygen, contains the yellow pigment bilirubin. Your body produces new cells to replace the red blood cells that degrade. The liver breaks down the older ones. Your skin may appear yellow if the liver is unable to process the broken down blood cells, leading to an accumulation of bilirubin in the body.



Fig. Surgery of Jaundice

It is common for many healthy infants to exhibit signs of jaundice within their first week of life, a condition that typically resolves on its own. Nevertheless, jaundice can occur at any stage of life and may indicate an underlying health issue. The causes of jaundice are varied and can include several factors.

- Blood diseases
- Genetic syndromes
- Liver diseases, such as hepatitis or cirrhosis
- Blockage of bile ducts
- Infections
- Medicines

Your choice or viewpoint : The reason for the jaundice and the bilirubin level are just two of the many variables that affect treatment. Preventing the rise of bilirubin to hazardous levels is the aim. Possible course of treatment:

Phototherapy

Since bilirubin absorbs light, exposing a baby to certain blue spectrum lights typically results in a decrease in both jaundice and elevated bilirubin levels. Phototherapy is used day and night and can take many hours to start functioning. To expose all of the skin to the sun, the baby's position is adjusted. During phototherapy, the baby's eyes must be kept safe and their temperature must be kept track of. Bilirubin levels in the blood are measured to see if phototherapy is effective.



Fig. Phototherapy

Use Of A Fiberoptic Blanket :

A fiberoptic blanket placed beneath the infant is an additional method of phototherapy. This can be applied either on its own or in conjunction with routine phototherapy.

Exchange Transfusion :

The infant's damaged blood may be replaced with fresh blood by an exchange transfusion. This lowers bilirubin levels and raises the red blood cell count. Small volumes of blood are alternately given and taken through an artery or vein during an exchange transfusion. Recurring exchange transfusions can be necessary if the bilirubin levels don't drop.

Discontinued Breastfeeding :

It is common for breastfeeding to be stopped for one to two days in order to treat breast milk jaundice. Bilirubin levels are frequently lowered when the infant is fed formula. After then, breastfeeding can continue.

Jaundice Diet:

Diet therapy and physical rest:



Fig. Diet therapy

Viral jaundice of a milder kind can be quickly cured with diet therapy and rest. But depending on the origin and how it is removed, recovery from jaundice brought on by a blockage in the bile ducts can be gradual.

Juice fasting followed by a diet high in fruits:

The patient ought to embark on a week-long juice fast and take it easy until the disease's acute symptoms subside. He may follow the juice fast with a three- to five-day all-fruit diet, including three meals a day consisting of fresh, juicy fruits spaced five hours apart.

A simple, low-carb diet can be followed:

Low in fat and simple to digest, the following foods are part of a diet that can aid in the healing of jaundice Vegetables and fruits: Citrus fruits, berries, papayas, melons, avocados, olives, tomatoes, carrots, beets, and turnips are examples of colorful fruits and vegetables

Plant-derived proteins: Plant-based proteins such as nuts and legumes are high in fiber, vitaminE,and good fats and can aid in healing

Whole grains: A wonderful source of fiber are oatmeal and other whole grains. Trimmed animal proteins are sources of lean protein.

Jaundice And Breastfeeding:

The yellow pigment known as bilirubin, which is produced when old red blood cells break down, accumulates in the blood and causes jaundice. Red blood cell breakdown is typical, but because the bilirubin is metabolized by the liver and eliminated into the stomach, it normally does not result in jaundice. In contrast, the liver enzyme that metabolizes bilirubin is very immature in the first few days of life, which is why a newborn baby frequently develops jaundice. Moreover, newborns have more red blood cells than adults do, which means that more of them are undergoing breakdown at any given moment.

Breast milk Jaundice :

Breastmilk jaundice is a popular term for a medical problem. The exact cause of jaundice from breast milk is unknown. The infant must be at least one week old for this diagnosis to be made, yet it's important to note that many infants with breastmilk jaundice also have excessive physiologic jaundice. Topic #5: Is my baby getting enough milk? The infant should be doing well on breastfeeding alone, gaining weight, having frequent bowel movements, passing lots of clean urine, and generally feeling good. In these circumstances, the infant presents with what some refer to as "breastmilk jaundice." However, occasionally, urinary tract infections, underactive thyroid glands, and a few other uncommon diseases can also present with the same symptoms.10–21 is when breast milk jaundice peaks

around 10–21 days, though it could continue for two to three months. Jaundice from breastmilk is common. Breastfeeding seldom, if at all, needs to be stopped, even for a little period of time. There is absolutely no proof that the newborn experiences any problems as a result of this jaundice. It is not appropriate to stop breastfeeding "in order to make a diagnosis".

Herbal Treatment of Jaundice:-

Here are a few successful herbal treatments for jaundice:

Jaundice berry is an effective herb, particularly for jaundice, for all types of liver disorders. Quarter teaspoons of this bitter tonic should be administered several times a day to a patient suffering from jaundice.

Jaundice and other liver issues are also treated with Indian aloe. For ten days, the pulp of one of its leaves should be consumed every morning together with ginger and black salt for best effects.

Indian sorrel helps alleviate jaundice as well. It is consumed with buttermilk made from cow's milk.

Chicory plant is another helpful natural cure for jaundice. Liver disorders can benefit from the use of the entire chicory plant. The most commonly used parts are the roots, seeds, and blooms. Chicory juice has been shown to be effective in treating jaundice-related conditions such as spleen enlargement, bile flow obstruction, and liver sluggishness. It also encourages the bile to secrete in a healthful manner.

IV. CONCLUSION

Jaundice is very common disease. Yellowing of skin, sclera and mucous membranes are common manifestations of jaundice due to defect in production, excretion and metabolism of bilirubin. Jaundice can have two causes: acquired or congenital. For differential diagnosis, ultrasonography and serum bilirubin levels are employed. Consuming a lot of water and eating a low-fat diet are the best ways to treat jaundice. Depending on the type of jaundice, different treatments are needed.

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